

**REMARKS**

Claim 97-129 are pending, with claims 1-96 having previously been canceled and claims 97-107 and 114-129 having been withdrawn from consideration. Claims 108 and 110 have been amended without prejudice. Specifically, reference to “an aromatic moiety, a DNA intercalator, a heterocyclic moiety, and a reporter group” has been deleted in claims 108 and 110. Also, Applicants have corrected a typographical error in the core structure in claim 108. These amendments have been made to focus prosecution on particularly preferred embodiments of Applicants’ more general invention, not for reasons related to patentability. Applicants also believe that these amendments address the concern expressed in the Office action with respect to the claims including non-elected subject matter. Notwithstanding the foregoing, Applicants reserve the right to pursue subject matter no longer or not yet claimed in this or a related patent application.

With regard to trademark-related matters, the application’s abstract, and issues related to incorporation by reference (see the Office action, paragraphs 5-7), Applicants respectfully request that they be held in abeyance until a notice of allowable subject matter issues, at which time Applicants will address these issues, if and as necessary. Similarly, Applicants will cancel without prejudice claims drawn to non-elected subject matter after a notice of allowable subject matter is received.

Applicants thank the Examiner for conducting a telephonic interview with Applicants’ undersigned attorney on 22 March 2004, and they respectfully request reconsideration of the invention as now claimed in view of the following additional remarks.

**35 USC 112, Second Paragraph, Rejections**

Claims 108-113 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for several reasons. As an initial matter, Applicants note that in claims 108 and 110, as amended, each of the B1 and B2 moieties is independently recited to be selected from the group consisting of H, a naturally occurring nucleobase, and a non-naturally occurring nucleobase, thereby obviating the bases of rejection raised in points 9, 10, 11, and 12. Below, Applicants address the issues raised in points 8, 13, and 14.

To the extent points 8 and 14 of the Office action apply to the claims, as amended, Applicants respectfully submit that the term “non-naturally occurring nucleobase” satisfies the requirements of 35 U.S.C. §112, second paragraph. Briefly, this statutory provision simply requires that claim terms define the invention with a reasonable degree of particularity so that one skilled in the art can ascertain its scope. There is no requirement that all members within a defined class be specifically described in terms of structure. In light of this standard, Applicants respectfully submit that those skilled in the art will understand the term “nucleobase” to refer to any heterocyclic base that can be incorporated into a nucleic acid molecule and, when so incorporated, provides the capability for annealing, or hybridization, via Watson-Crick or Hoogsteen base-pairing with a nucleobase in another nucleic acid (see page 28, lines 3-26, of the specification). As such, the term includes both naturally occurring and non-naturally occurring nucleobases. For example, page 13, lines 18-26, of the specification states:

“A ‘monomer’ of a nucleic acid analogue is a unit comprising a nucleobase, or a derivative or analogue thereof (or, in some instances, moieties such as labels, intercalators, or nucleobase binding moieties) covalently linked to a backbone molecule that is capable of covalently linking to other backbone molecules to form a polymer. The monomer unit of a nucleic acid is a nucleotide or nucleoside, in which a nucleobase is attached to a sugar-phosphate backbone. The monomer unit of a peptide nucleic acid is a nucleobase (or nucleobase analogue, nucleobase-binding group, ligand, intercalator, reporter group, or label) that is covalently attached to an amino acid or amino acid derivative or analogue.”

In the above-cited section, a monomer of nucleic acid analogue is defined to include a nucleobase (or derivative or analogue) covalently linked to a backbone-forming molecule (defined at specification page 14, lines 18-30). In a nucleic acid (e.g., DNA), the monomer is “a nucleotide or nucleoside,” which contains a nucleobase attached to a sugar phosphate backbone.

At page specification page 14, lines 5-17, Applicants define “nucleobase” as follows:

“A ‘nucleobase’ is a heterocyclic base such as adenine, guanine, cytosine, thymine, uracil, inosine, xanthine, hypoxanthine, or a heterocyclic derivative, analogue, or tautomer thereof. A nucleobase can be naturally occurring or non-naturally occurring. Nonlimiting examples of nucleobases are adenine, guanine, thymine, cytosine, uracil, xanthine, hypoxanthine, 8-azapurine, purines substituted at the 8 position with methyl or bromine, 9-oxo-N<sup>6</sup>-methyladenine, 2-aminoadenine, 7-deazaxanthine, 7-deazaguanine, 7-deazaadenine, N<sup>4</sup>, N<sup>4</sup>-ethanocytosine, 2,6-diaminopurine, N<sup>6</sup>, N<sup>6</sup>-ethano-2,6-diaminopurine, 5-

methycytosine, 5-(C<sup>3</sup>-C<sup>6</sup>)-alkynylcytosine, 5-fluorouracil, 5-bromouracil, thiouracil, pseudoisocytosine, 2-hydroxy-5-methyl-4-triazolopyridine, isocytosine, isoguanine, inosine, 7,8-dimethylalloxazine, and the non-naturally occurring nucleobases described in U.S. Patent Nos. 5,432,272 and 6,150,510 and PCT applications WO 92/002258, WO 93/10820, WO 94/22892, and WO 94/24144, all herein incorporated by reference in their entireties.”

While not exhaustive of all possible nucleobases in the context of the invention, the above definition, together with the other definitions and descriptions in the specification that relate to “nucleobases,” clearly informs those skilled in the art what is meant by the term “nucleobase,” as Applicants use the term in their claims. Moreover, those skilled in the art appreciate that the “nucleobase” is analogous to terms such as “base” in, for example, U.S. patent no. 5,432,272, cited and incorporated by reference in the instant application.

In addition to the foregoing parts of the specification, the term “nucleobase”, both naturally occurring and non-naturally occurring, are described at other locations, as well. For example, at page 27, lines 5-7, Applicants define naturally occurring nucleobases to include “adenine, guanine, cytosine, thymine, uracil, inosine, 5-methylcytosine, xanthine, and hypoxanthine.” They then go on to list several additional non-naturally occurring nucleobases or nucleobase analogues, including “azaadenine, azacytosine, azaguanine, 5-bromo-uracil, thiouracil, bromothymine, 7,8-dimethyl alloxazine, and 2,6-diaminopurine.” *Id.*, lines 8-10. See also page 45, lines 21-26, and page 58, lines 4-9. As claims are to be read in light of the specification, and to the extent that resort to the specification is made, it is clear that at several locations the specification defines the term with sufficient clarity to satisfy the requirements of 35 U.S.C. §112, second paragraph. Accordingly, the bases of rejection set forth in points 8 and 14 of the Office action should be withdrawn.

Turning to the rejection of claims 110 and 112 premised on the alleged vagueness of the term “phosphono peptide nucleic acid monomer”, Applicants respectfully direct the Examiner’s attention to page 20, line 1, through page 25, line 15, where examples of these monomers are described. Similarly, dimers comprising phosphono peptide nucleic acid monomers coupled to other monomer types are also described throughout the specification. See, for example, page 40, line, through page 45, line 19. Those skilled in the art can readily deduce the phosphono peptide nucleic acid monomer components of these molecules. Accordingly, Applicants respectfully submit that the basis of rejection in point 13 in the Office action should also be withdrawn.

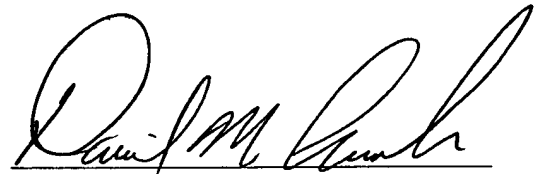
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# CONCLUSION

Applicants respectfully submit that claims 108-113 are in condition for allowance, and they earnestly solicit an early notice to such effect. Should any issues or questions remain, the Examiner is encouraged to telephone the undersigned at 858.350.9690 so that they may be promptly resolved without the need for an additional formal action and response thereto.

Respectfully submitted,

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